NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

COVER CROP

(Ac.)

CODE 340

DEFINITION

Grasses, legumes, forbs, or other herbaceous plants established for seasonal cover and other conservation purposes.

PURPOSE

- Reduce erosion from wind and water.
- Sequester carbon in plant biomass and soils to increase soil organic matter content.
- Capture and recycle excess nutrients in the soil profile.
- Promote biological nitrogen fixation.
- Increase biodiversity.
- Weed suppression.
- Provide supplemental forage.
- Soil moisture management.
- Reduce particulate emissions into the atmosphere.

CONDITIONS WHERE PRACTICE APPLIES

On all lands requiring vegetative cover for natural resource protection

CRITERIA

General Criteria Applicable to All Purposes

Plant species, seedbed preparation, seeding rates, seeding dates, seeding depths, and planting methods will be consistent with approved local criteria (including all federal, state, and local laws) and site conditions.

The species selected will be compatible with the nutrient management and pest management provisions of the plan. See Table 1 for selection of Cover Crops.

Cover Crops will be terminated by harvest, frost, mowing, tillage, and/or herbicides in preparation for the following crop.

Herbicides used with cover crops will be compatible with the following crop

Cover Crop residue will not be burned

Additional Criteria to Reduce Erosion from Wind and Water

Cover Crop establishment, in conjunction with other practices, will be timed so that the soil will be adequately protected to control erosion to within the soil loss tolerance (T) during the critical erosion period(s).

Plants selected for cover crops will have the physical characteristics necessary to provide adequate protection. See Table 1 for selection of Cover Crops.

The amount of surface and/or canopy cover needed from the Cover Crop shall be determined using current erosion prediction technology.

Additional Criteria to Sequester Carbon in Plant Biomass, in the Soil, and to Increase Soil Organic Matter Content

Cover Crop species will be selected on the basis of producing high volumes of organic material to maintain or improve soil organic matter.

The NRCS Soil Conditioning Index (SCI) procedure will be used to determine the amount of biomass required.

The Cover Crop will be terminated as late as feasible to maximize plant biomass production, considering the time needed to prepare the field for planting the next crop.

Additional Criteria to Capture and Recycle Excess Nutrients in the Soil Profile

Cover Crops will be established and be actively growing before expected periods of high precipitation that can cause leaching.

Cover Crop species will be selected for their ability to absorb large amounts of nutrients from the rooting profile of the soil.

The aboveground biomass will be removed from the field for maximum nutrient removal efficiency, when nutrients will not be recycled through a subsequent crop.

Additional Criteria to Promote Biological Nitrogen Fixation

Only legumes or legume grass mixtures will be established as Cover Crops.

The specific Rhizobium bacteria for the selected legume will either be present in the soil or the seed will be inoculated at the time of planting. See Agronomy Technical Note #3 for information on the use of inoculants.

Nitrogen credits from legume Cover Crops will be accounted for in the nutrient management plan. See Agronomy Technical Notes #10-15 for information on the preparation of a Nutrient Management Plan.

Additional Criteria to Increase Biodiversity

Cover Crop species shall be selected that, have different maturity dates, attract beneficial insects, serve as a trap crop for damaging insects, and/or provide food and cover for wildlife habitat management.

Additional Criteria for Weed Suppression

Species for the Cover Crop will be selected for their chemical or physical characteristics to compete with weeds.

Cover Crops residues will be left on the soil surface to maximize allelopathic (chemical) and mulching (physical) effects.

For long-term weed suppression, perennials and/or biennial species can be used.

Additional Criteria to Provide Supplemental Forage

Species selected will have desired forage traits, be palatable to livestock, and not interfere with the production of the subsequent crop.

Forage provided by the Cover Crop may be hayed or grazed as long as sufficient biomass is left for resource protection.

Additional Criteria for Soil Moisture Management

Terminate growth of the Cover Crop sufficiently early to conserve soil moisture for the subsequent crop.

Cover Crops established for moisture conservation shall be left on the soil surface until the subsequent crop is planted.

In areas of potential excess soil moisture, allow the Cover Crop to grow as long as possible to optimize soil moisture removal.

Additional Criteria to Reduce Particulate Emissions into the Atmosphere

Manage Cover Crops and their residues so that at least 80% ground cover is maintained during planting operations for the following crop.

CONSIDERATIONS

Maintain an actively growing Cover Crop as late as feasible to maximize plant growth, allowing time to prepare the field for the next crop.

Use deep-rooted species to maximize nutrient recovery.

Consider that grasses utilize more soil nitrogen, and legumes utilize both nitrogen and phosphorus.

Avoiding Cover Crop species that attract potentially damaging insects.

For most purposes for which Cover Crops are established, the anticipated benefits are usually accomplished when the plant density is at least 25 stems per square foot, the combined canopy and surface cover is at least 60 percent, and the above ground (dry weight) biomass production is at least 2700 lb/acre.

Cover Crops may be used to improve site conditions for establishment of perennial species.

Consider using plant species that enhance biomass collection opportunities.

Small grains are limited on dryland areas to those that normally receive at least 10 inches of precipitation.

Dryland seedings of sorghum and Sudangrass are limited to areas that average at least 12 inches of precipitation, more than 1 inch of average precipitation in July, and an average July temperature above 65 degrees F.

Cover Crops should be seeded as soon as possible after harvest or broadcast prior to harvest. When broadcast, the seeding rate will be double the specified drilled rate shown in Table 1.

Sudangrass and foxtail millet are good summer Cover Crops. They should be planted in spring or early summer after the soil temperature is above 70 degrees F and the danger of frost is past. Sudangrass should be grazed with caution because it may develop prussic acid. Defer grazing until the plants are 10 to 25 inches high. Prussic acid poisoning will remain a threat to livestock after frost until the Sudangrass is completely dry, which takes from 1 to 6 days.

Irrigated Green Manure Cover Crops

Alfalfa – plow down the last cutting in late summer.

Yellow Sweet Clover – seed with a small grain crop in the spring. Plow down in late summer or early spring of the following year.

Hairy Vetch – plant with small grain in the spring. Plow down in late summer.

Dryland Green Manure COVER CROPS

Due to the potential for soil moisture depletion, green manure crops are not recommended in dryland cropping systems.

In general, Cover Crops are those rapidly growing plants, usually small grains or annual grasses that provide temporary soil protection.

Green manure crops are those leguminous crops that have a symbiotic relationship with nitrogen-fixing bacteria (Rhizobium spp.) that will produce nitrogen for this and succeeding crops.

If needed, fertilizer should be applied to increase the effectiveness of cover plants. Application rates should be based on soil tests and be consistent with University of Wyoming recommendations.

Water budgets will be affected by this practice. The volume and rate of runoff water may be less, and infiltration will normally increase, although the growing crop will deplete soil moisture. Soil moisture depletion may be offset by enhanced snow storage.

The Cover Crop vegetation will reduce the movement of wind and water borne sediment, pathogens, and sediment-attached substances.

Growing vegetation will utilize available nutrients in the root zone. Decaying vegetation may tie up, then release nutrients into the root zone. Fertilizer application may be needed to offset this temporary immobilization of nutrients.

PLANS AND SPECIFICATIONS

Plans and specifications will be prepared for the practice site. Plans for the establishment of Cover Crops shall include:

- Specie or species of plants to be established.
- Seeding rates and planned dates of establishment.
- Planned method of establishment
- Planned rates and timing of nutrient application.
- Planned dates for destroying cover crop.
- Other information pertinent to establishing and managing the Cover Crop.

Plans and specifications for the establishment and management of Cover Crops may be recorded in narrative form, on job sheets, or on other forms.

OPERATION AND MAINTENANCE

Control growth of the Cover Crop to reduce competition from volunteer plants and shading.

Control weeds in Cover Crops by mowing or by using other pest management techniques.